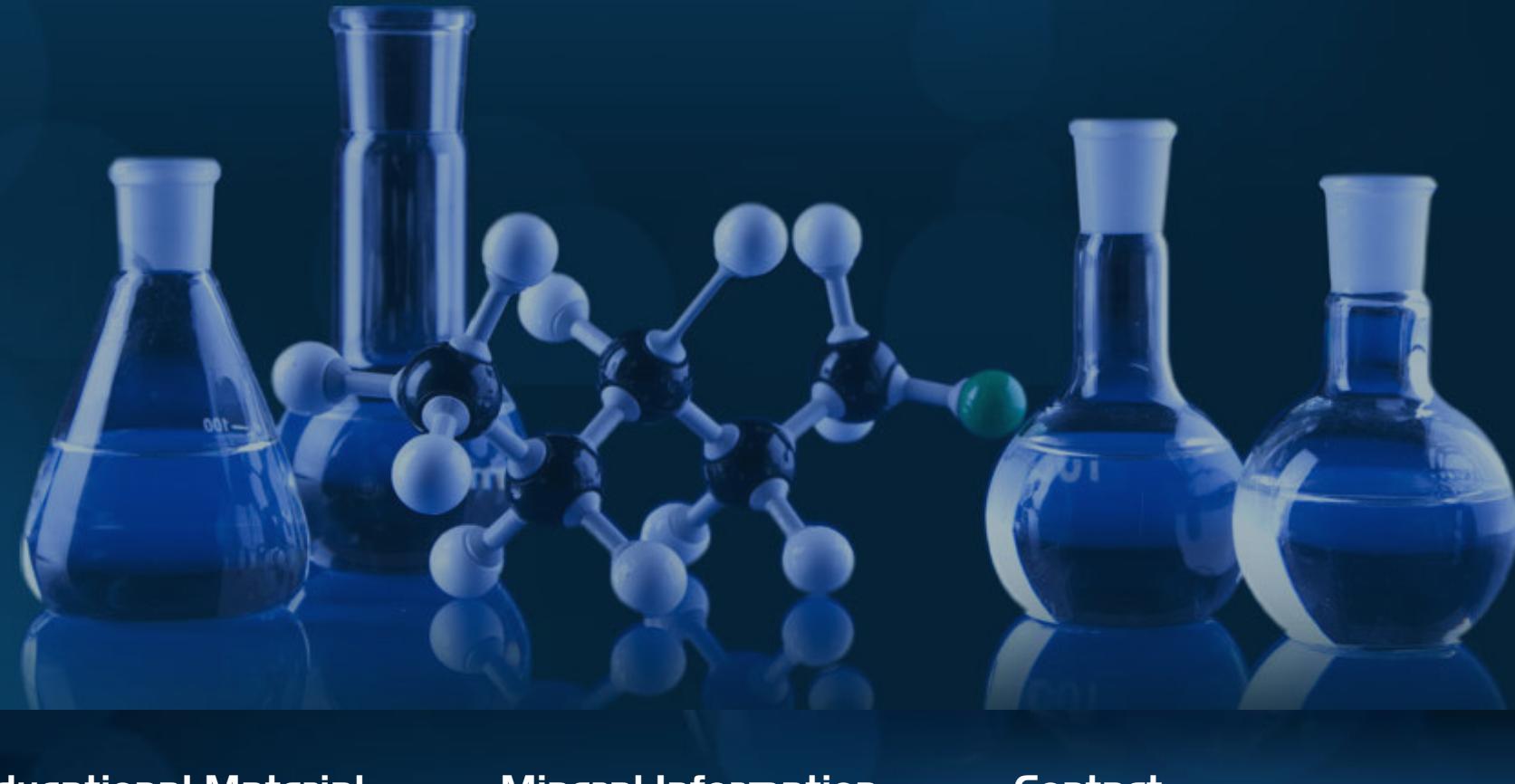




## ARL is an Authority on Nutrition and the Science of Balancing Body Chemistry Through Hair Tissue Mineral Analysis!

Hair Tissue Mineral Analysis



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## Muscle Problems

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### Muscle Cramps, Muscle Tone and Muscle Weakness

Muscle pain, weakness and cramping are frequent complaints today. Hair mineral testing can often provide clues regarding the cause and correction of these common but annoying health problems.

#### Oxidation Type And Muscles

**Fast oxidizers** have relatively low tissue levels of calcium and magnesium. This contributes to a tendency for muscle cramps and tightness. The symptoms worsen when under stress. Healthy fast oxidizers often have good muscle tone.

**Slow oxidizers** may have muscle cramps due to bio-unavailable calcium and magnesium, or potassium deficiency. They are also prone to muscle weakness due to overall fatigue and toxic metal poisoning. Let us explore this in more detail.

#### The Roles Of Calcium, Magnesium And Potassium

Muscle contraction is a electro-chemical activity regulated by several minerals. For example, **calcium** plays an important role in muscle relaxation. On a hair test, a very high calcium or a low calcium level indicates a trend for muscle cramping and spasms. Calcium may be deficient in the tissues, or it may be *bio-unavailable* (biologically unavailable). In this state, calcium is present but is not usable. An elevated calcium level on a hair test indicates bio-unavailability. Calcium is leaving the blood and precipitating or depositing in the hair. This calcium is not available for muscle relaxation and thus cramping may occur.

A high calcium level on a hair analysis also often indicates calcium deposits in the soft tissues. Deposits can occur in muscles, causing pain and symptoms of fibromyalgia. As body chemistry normalizes through a nutrition program, the deposits can be dissolved.

**Magnesium** also plays a vital role. Magnesium helps keep calcium in solution in the blood, allowing it to be biologically available. Many diets today are deficient in magnesium. Magnesium is also a primary element needed in the cells for energy production. Low magnesium or bio-unavailable high magnesium are thus associated with cramps and with muscle weakness.

Muscle cramps or weakness that occurs with exercise is often due to a magnesium deficiency. During exercise, the tissue sodium level rises due to the activity of the adrenal hormone, aldosterone. This tends to lower the level of magnesium, which then results in cramps.

**Potassium** also plays a role in muscle cramps and weakness. Potassium also helps keep calcium in an ionized form in the blood. In the slow oxidizer in particular, very low potassium levels can cause muscle cramps and muscle weakness. While the diet may contain adequate potassium, the tissue level becomes low in the slow oxidizer due to adrenal insufficiency. The adrenal hormones aldosterone and cortisone help maintain adequate tissue potassium levels. Fast oxidizers may also need extra potassium for muscle weakness. Potassium is normally recommended to fast oxidizers in the form of potassium aspartate because it is best absorbed in this form.

#### Copper, Zinc And Manganese

A high copper level on a hair analysis is associated with muscle weakness, pain, adhesions and cramping. Adhesions may occur because copper has a destructive effect upon connective tissue structures in the body. This is most commonly seen in women with ovarian and uterine adhesions, or endometriosis. The tissues are distorted and often adhered as a result of connective tissue dysfunction. Vitamin C, needed for connective tissue formation, is oxidized and destroyed by excessive copper.

A zinc deficiency is one cause of copper toxicity. It is best to consider the zinc/copper ratio, as a low zinc is often equivalent to a high copper. The ratio should not be below 6:1. One sign of zinc deficiency is stretch marks. These are tears in the connective tissues. They may come after a pregnancy or just due to stress, vegetarian diets, or other causes of zinc deficiency.

Elevated copper contributes to a high tissue calcium level. In this way, high copper can contribute to calcium deposits and muscle cramps due to bio-unavailable calcium.

**Manganese** is required for the integrity of the tendons and ligaments. A manganese deficiency may contribute to some cases of muscle pain and weakness.

#### Low Sodium/Potassium Ratio And Muscles

When the sodium/potassium ratio is low, the body is in a state of protein breakdown or catabolism. If severe or prolonged, muscle wasting, or muscle weakness will occur.

A low sodium/potassium ratio is also indicative of a glucose intolerance. Glucose intolerance due to stress or improper diet reduces energy levels and often results in muscle weakness.

#### Toxic Metals And The Muscles

Lead, mercury and cadmium may be involved in muscle disorders. **Lead** replaces calcium and is associated with neuro-muscular diseases. **Mercury** is also associated with neuromuscular disorders. **Cadmium** raises sodium levels, which can lower magnesium and calcium levels. Cadmium can cause deep pain, as it deposits on the periosteum or coverings of bones. Cadmium also interferes with zinc metabolism.

In summary, many minerals are involved in muscle function. Correcting the balance of the minerals using a hair analysis test can improve many cases of muscle cramps, spasms and weakness.

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